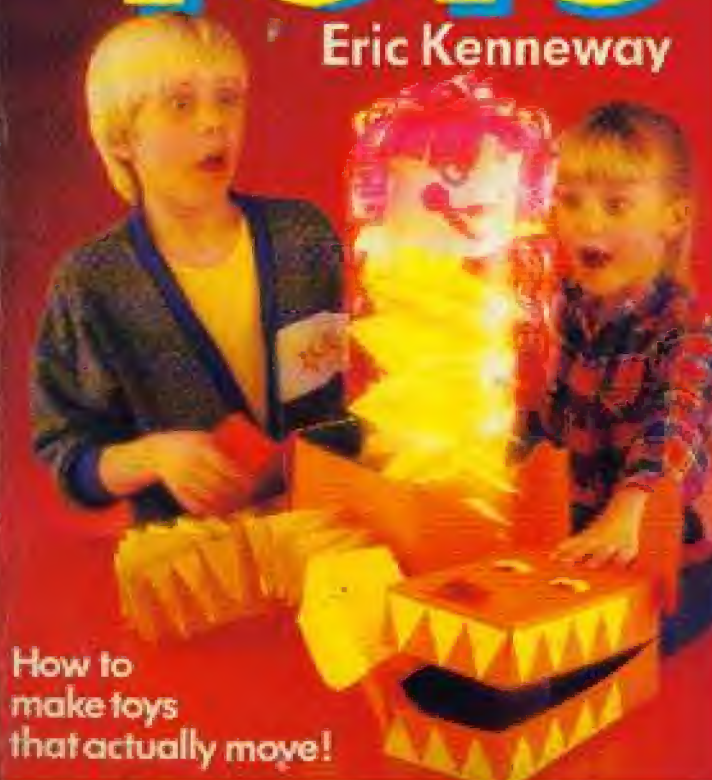




Action TOYS

Eric Kenneway



How to
make toys
that actually move!

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Introduction

This book begins by showing you a few things you can make in just a minute or two – and ends with instructions for making more advanced models, some of which you could easily give away as presents. Because they are all toys which move in some way, you will have both the pleasure of making them *and* the pleasure of making them ‘come to life’.

The projects here are both old and new, and from all over the world. For example, the footballers are new and work on a principle found in many modern pop-up books; whereas the flapping bird and leaping frog come from ancient Japan and are made using origami techniques. The ever-so-simple tapping typewriter comes from Venezuela in South America, and the mechanism for the battling boxers can be found in folk toys from Russia and Eastern Europe.

Detailed step-by-step instructions are given for each toy but don't be afraid to try out your own ideas and variations. In that way you can create something quite unique and personal to you. For example, the battling boxer mechanism can be used to activate all kinds of figures. So, just use your imagination!

Each project starts with a list of the things you will need. They are mostly everyday tools and materials which you can probably find at home or at school. But do remember that cutting instruments can be very sharp. If you are using a craft knife, do your cutting-out on a piece of old board so that you don't injure yourself or scratch any surface. Always keep your tools in a safe place,

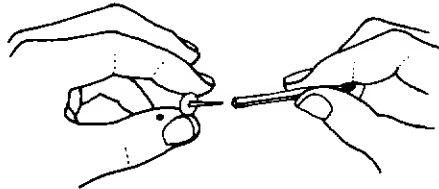
preferably in a box with a lid, and make sure that they are out of the reach of small brothers and sisters.

Finally it remains for me to wish you well in your activities and to thank Dave Brill, Larry Hart and Thoki Yenn for their ideas.

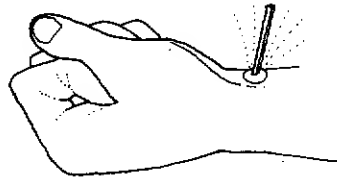
Throbbing pulse meter

You will need: *used matchstick*
drawing pin

1 Carefully push the end of a matchstick on to the point of a drawing pin.



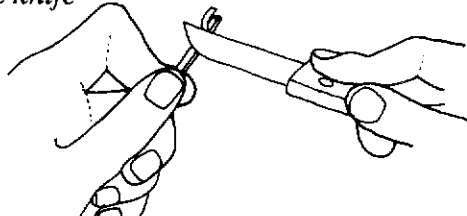
2 Stand it on your wrist, where you can feel your pulse. If you've found the right spot, the matchstick should swing, slightly but rhythmically, in time with your heart-beat.



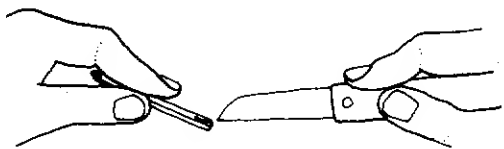
Running matchsticks

You will need: *two used matchsticks*
table knife

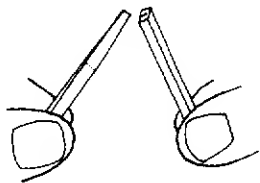
1 Trim the end of one matchstick to make it chisel-edged.



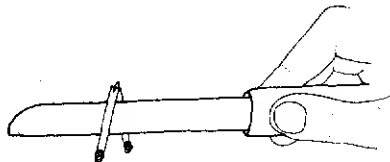
- 2 Cut a small slit in the end of the other matchstick.



- 3 Fit the two matchsticks together to form an upside-down 'V' shape. Think of this as a pair of legs.



- 4 First, hang the legs over the edge of a table knife; then hold the knife above a table so that the 'feet' just touch the surface (keep your hand free: don't let it rest on the table). The natural, slight tremor of your hand should make the matchsticks run rapidly along the blade.

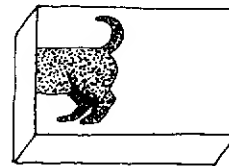


Stretching sausage dog

You will need: *empty matchbox*
colouring materials

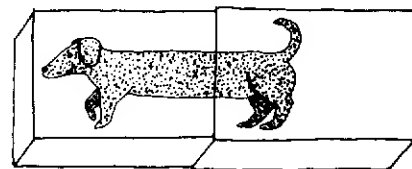
- 1 Open up a matchbox as far as it will go, and paint or draw the picture of a long, thin dog on the bottom – the

dog's head, front legs and long thin body on the inner tray, his tail and back legs on the outer as shown.



- 2 Push the two halves together so that your box looks like the above, and ask your friends to guess what type of dog you've drawn.

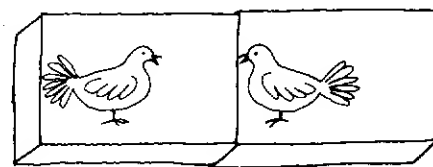
- 3 Then surprise them by opening the matchbox out – it's a sausage dog!



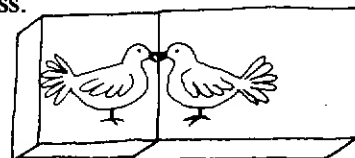
Kissing doves

You will need: *empty matchbox*
colouring materials

- 1 This time hold the box open as far as it will go and paint or draw two doves facing each other.



- 2 Close the box until the birds come together and kiss. Now try to think how you could use a matchbox to make other moving pictures.



Laughing man

You will need: *egg shell*
sticky tape
paper
modelling clay or similar
colouring materials

1 Find an egg shell which is not crushed but fairly neatly broken in two. Rinse it under the tap and dry it thoroughly.

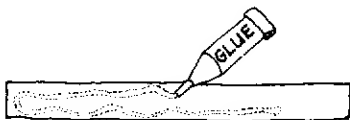
2 Place a nut-sized piece of modelling clay, or something similar, into the larger half of the shell; carefully press and spread the edges to fix it to the inside at the bottom.



3 Fit the two parts of the shell together as neatly as you can. Use small pieces of sticky tape to hold them together.

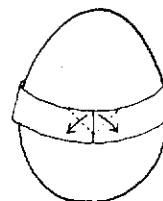


4 Glue a 1.5 x 15cm strip of paper. . .

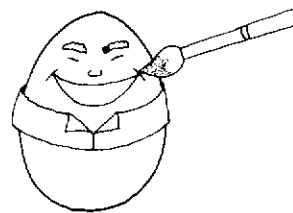


5 . . . and wrap it carefully around the egg so that you hide the join between the two points. If you fold back the

corners of the paper it will look rather like an old-fashioned collar.



6 Paint a face with a big smiling mouth – to make a little bald-headed man.



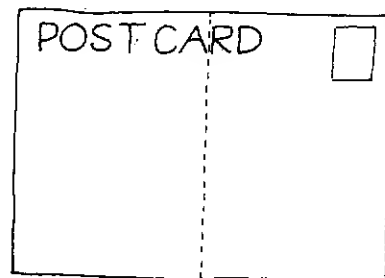
7 Stand him on a table and push him with your finger. He will rock back and forth, as if helpless with laughter.



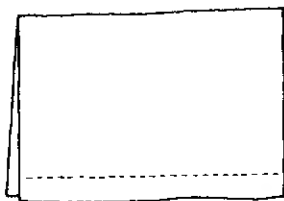
Tapping typewriter

You will need:
a postcard or stiff paper

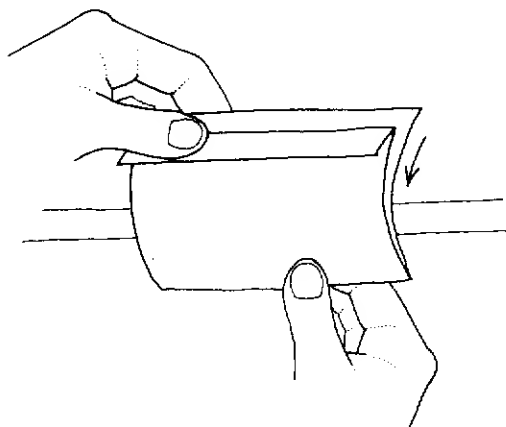
1 Fold the two shorter edges of the postcard together. Run your thumb along the fold to make a sharp crease.



2 On a line 1–2cm from the bottom edge, fold the upper layer.



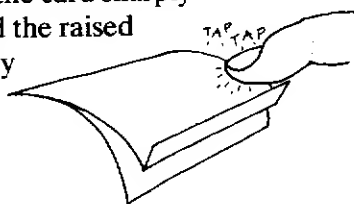
3 Now curve the card by rubbing it a few times over the edge of a table – or curve it with a ruler as described on page 58.



4 Raise the long narrow flap so that it stands out from the card. This completes the construction.



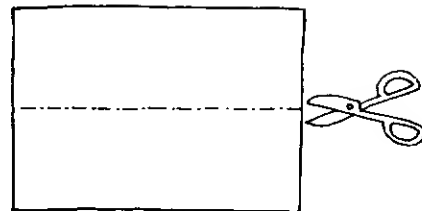
5 Use two fingers to tap the card sharply and repeatedly just behind the raised edge, and it will rattle away just like a typewriter.



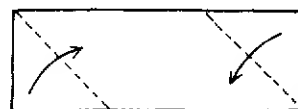
Whirling sails

You will need: *writing paper*
scissors
glue
drinking straws

1 Fold the longer edges of a sheet of writing paper together. Crease firmly and cut along the crease line. Discard one half.



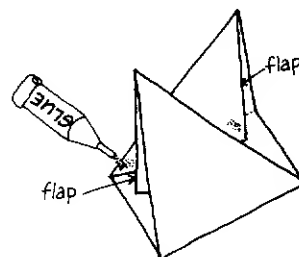
2 Fold the shorter edges of the other half to meet the longer edges as shown.



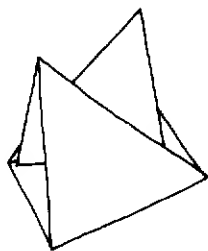
3 Then fold the triangular areas so that they stand up from the main part of the paper. . .



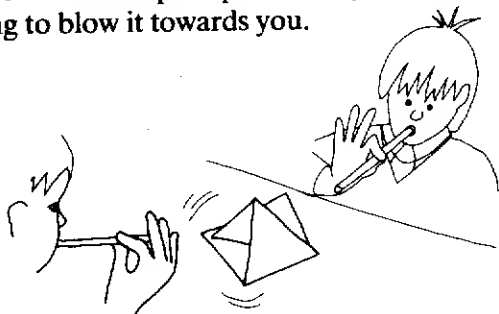
4 . . .like this. Put a spot of glue on one of the triangular flaps. . .



5 ... and stick the flaps together. This gives you a curious-looking 'boat' with two open pockets or sails, each facing away from the other.



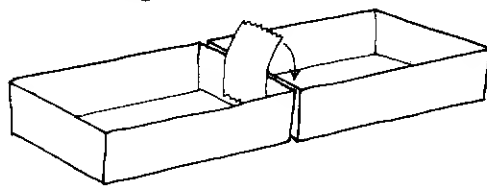
6 Place the boat in the middle of a large table and try to send it across to the other side by blowing it through a straw. You'll find this isn't so easy to do, as the boat tends to whirl and spin – particularly if someone opposite is trying to blow it towards you.



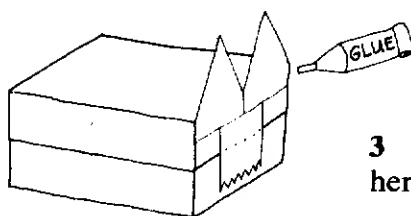
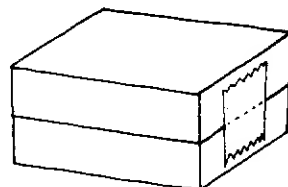
Snapping dog

You will need: two empty matchboxes
ruler
paper scraps
sticky tape
glue
colouring materials

1 Lay the trays from two empty matchboxes end to end. Fasten them together with a piece of sticky tape. This will be the dog's head.

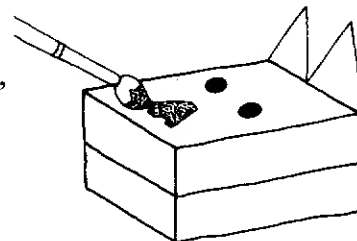


2 Bring one of the trays over to cover the other like a lid and use a second piece of sticky tape to reinforce the hinge.

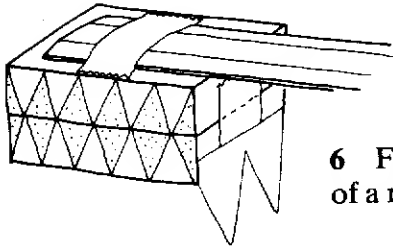
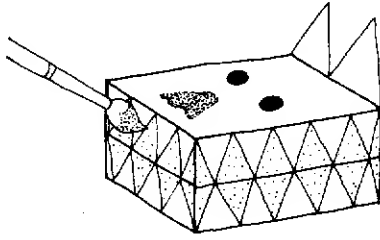


3 Glue scraps of paper here to represent the ears.

4 Draw a big pair of eyes, and a nose, on the top.

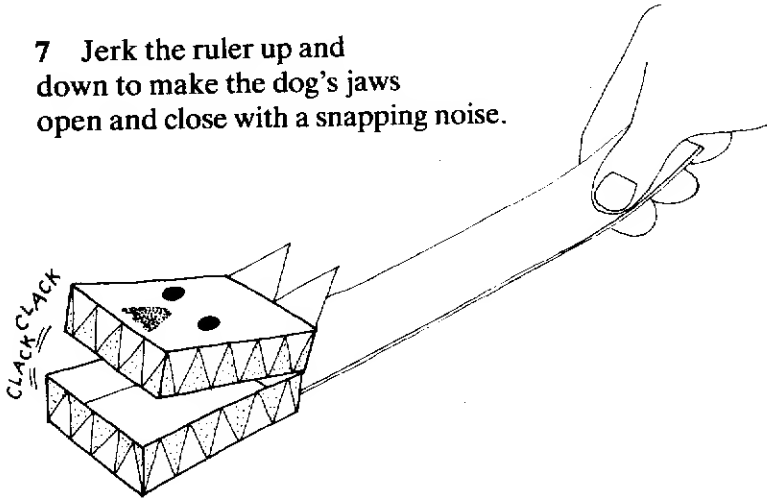


5 Draw fierce teeth all the way around the sides.



6 Finally fasten to one end of a ruler with sticky tape.

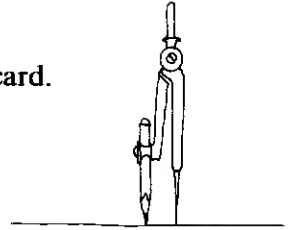
7 Jerk the ruler up and down to make the dog's jaws open and close with a snapping noise.



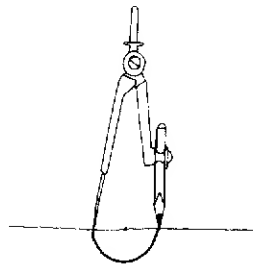
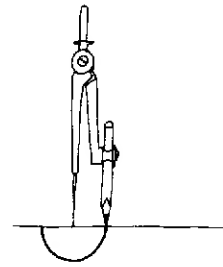
Circling serpent

You will need: *drawing paper or thin card*
pencil and ruler
scissors
compass
thread
sticky tape

1 Start by lightly drawing a straight line across the centre of your sheet of paper or card. With the compass almost closed, place the point in the centre of this line and describe an arc on the near side . . .

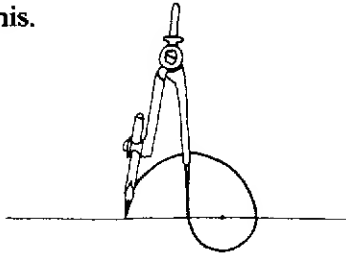


2 . . . like this.

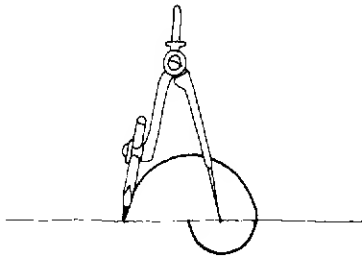


3 Keep the pencil point in place and take the point of the compass to the other end of the arc. Then describe an arc on the far side of the centre line . . .

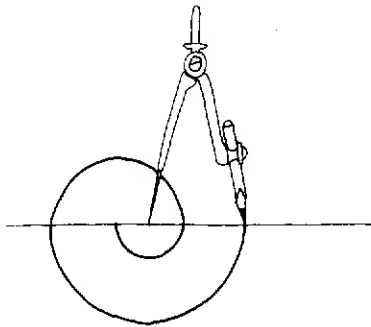
4 . . . like this.



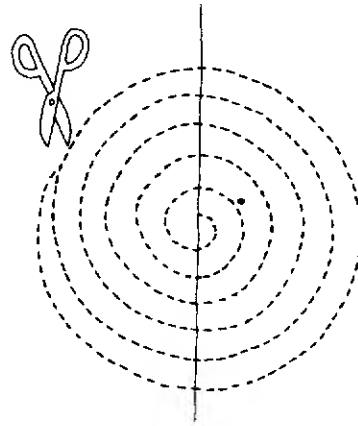
5 Keep the pencil point in place and take the point of the compass to the original starting point.



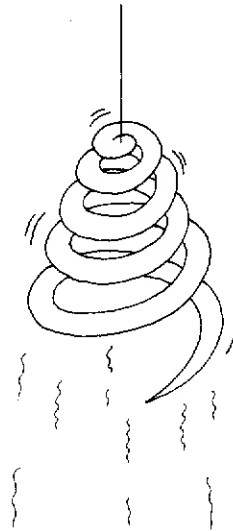
6 Continue the curve by describing an arc on the near side. Continue to form arcs, increasing the radius each time. . .



7 . . . until the spiral is completed. The tail is formed by carrying the final arc across the centre line. Cut out this shape.



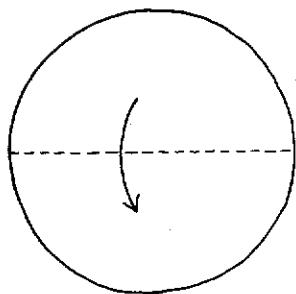
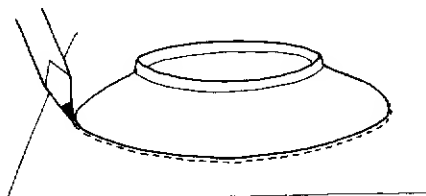
8 Hang it with thread from the ceiling above a source of heat such as a radiator, a television set or a standard lamp. When warm air rises the serpent will spin around.



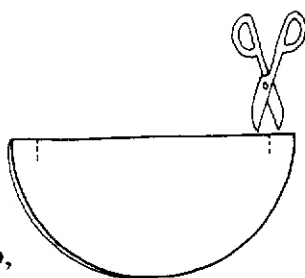
Rocking see-saw

You will need: *paper*
pencil and ruler
scissors
colouring materials
saucer

1 Place a saucer face down on a sheet of paper and draw around the edge. Remove the saucer and cut along the line to make a paper disc.

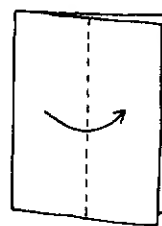


2 Fold the disc in half.

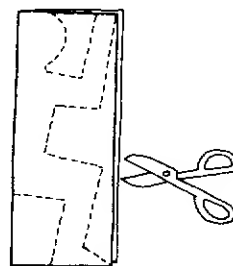


3 Cut a slit, about 1cm deep, near either end of the folded edge.

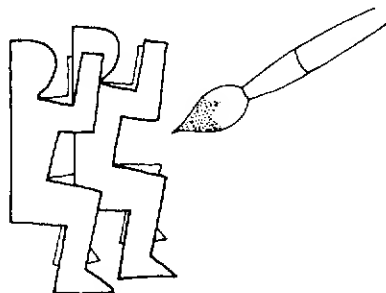
4 Prepare a rectangle of paper about 8 × 12cm. Fold the shorter edges together; then take the folded edge to the raw edges as shown.



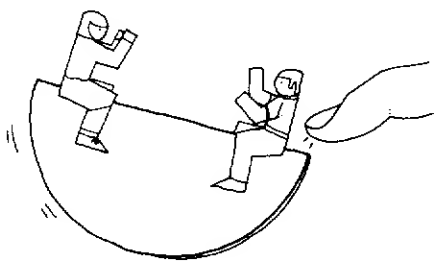
5 Draw one half of a seated figure centred on the folded edge. Cut through all layers. . . .



6 . . . and you'll find you have cut-outs of two seated figures. Paint and decorate them to represent a boy and a girl. You can trim the arms down if you want, and position them in different ways.



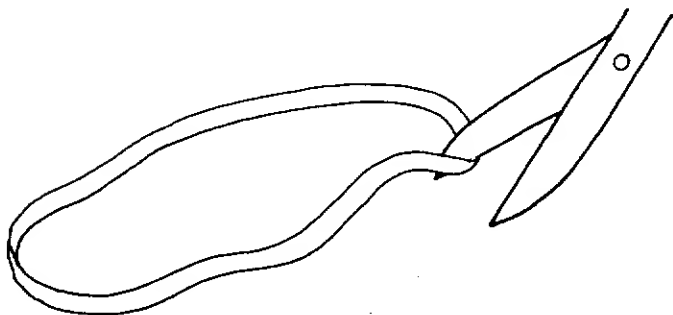
7 Slide the figures into the slits so that they sit firmly on the see-saw. Apply a little pressure and the children will start to rock.



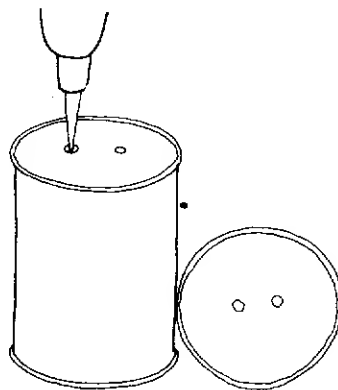
Returning roller

You will need: *fairly large rubber band*
tin can with detachable lid
metal nut or several washers
thread or string
scissors

1 Cut the rubber band to make one long elastic strip.



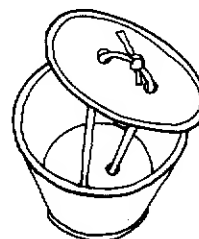
2 Bore two holes in the bottom of the can and two similar holes in the lid. (You should ask an adult to help you with this part.)



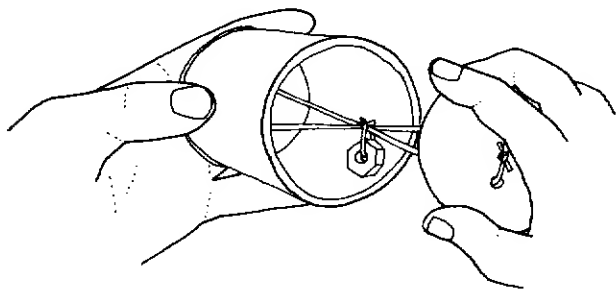
3 Tie a piece of string or thread to your metal nut or washers to form a weight.



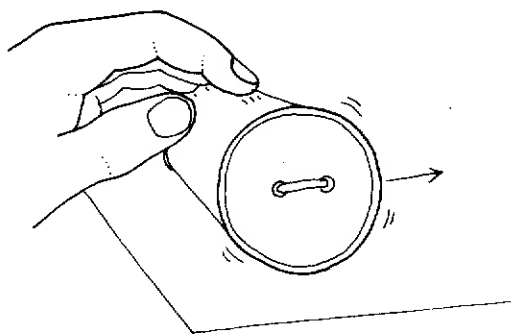
4 Now weave the cut rubber band through all the holes in your tin can and lid, then tie the two ends together in a knot.



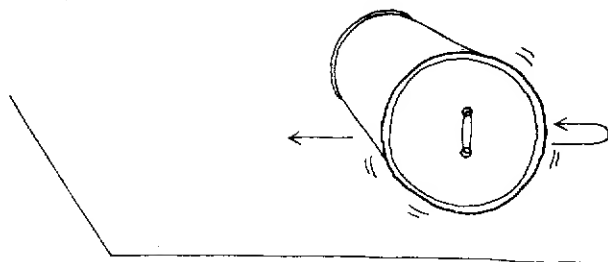
5 Hold the can and lid in either hand and pull apart. Turn the lid until the two stretched strands of the rubber band cross. Tie the weight to the two strands where they cross (it's much easier if you can get someone else to do this while you hold the can and lid apart). Finally, put the lid back on the can.



6 Roll the can, gently at first, across a smooth level surface such as a kitchen table or tiled floor. (It probably won't work on a carpeted floor.)



7 After first rolling forward, the can will stop and then roll back towards you! This mysterious effect is caused by the weighted rubber band hidden inside: it wound up as the can rolled forward and now unwinds.



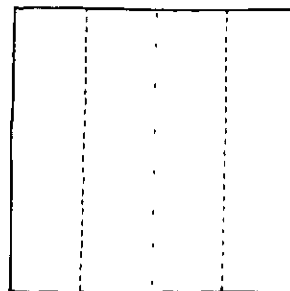
Leaping frog

For this toy, and for the **Flapping bird** which follows, you will need paper which is strong but not thick. A square cut from a sheet of good quality typing paper will do.

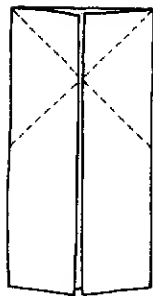
Make sure that the paper is really square and try to be as accurate as you can when you come to fold it. Run your finger or thumb along each folded edge to make firm creases and so build up neat shapes.

You will need: *square of paper*

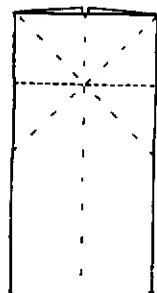
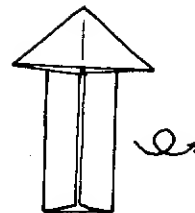
1 Mark the centre line by folding the square in half. Crease firmly and unfold. Then fold two opposite edges to the centre.



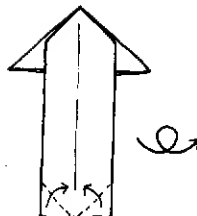
2 Fold the top edge to the left edge, crease and unfold; then fold it to the right edge, crease and unfold. Turn the paper over.



6 Turn the paper over.

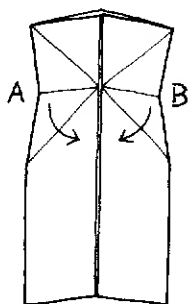


3 Fold the top edge down to where the creases meet. Crease and unfold. Turn the paper over.

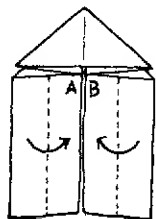
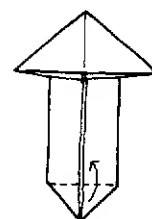


7 Fold the bottom corners to the centre crease. Turn over.

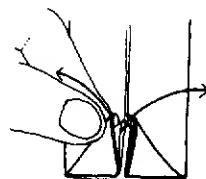
4 Bring the top edge down and push against the sides at points A and B. . .



8 Fold up the bottom point.

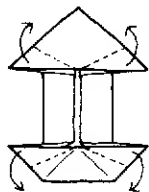


5 . . . to make a triangular shape at the top. Lifting the two flaps of the triangle out of the way, fold the sides to the centre. Press the flaps back down.

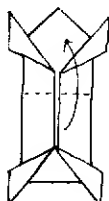


9 Lightly take hold of the sides of the bottom triangular flap and pull the outer layers to left and right. Press the paper flat. . .

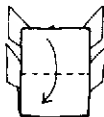
10 . . . to look like this. Fold four corners as shown.



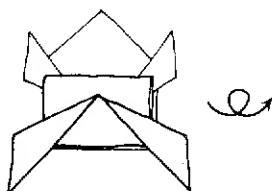
11 Fold the bottom edge to the top point.



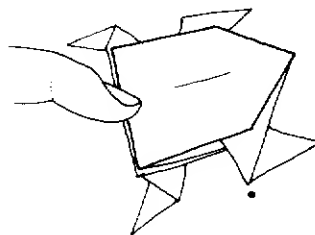
12 Fold the top edge to the bottom edge.



13 This is the result. Turn over. . .



14 . . . and the frog is completed. Stand him on a flat surface. Slide your finger down his back and off the edge. . .



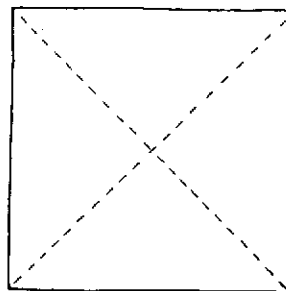
15 . . . to make him jump. Perhaps you can make him turn a somersault!



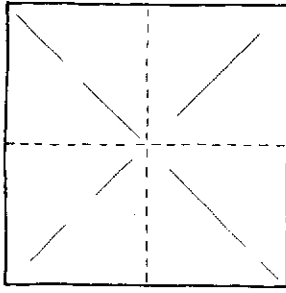
Flapping bird

You will need: *square of paper*

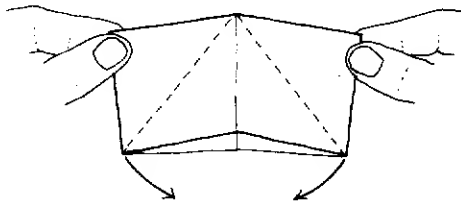
1 Fold opposite corners of the square together in turn: make very firm creases and open up. Turn the paper over.



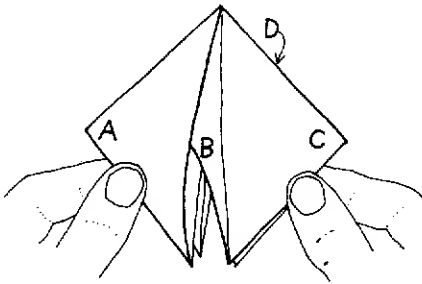
2 This time fold opposite edges together in turn and again make very firm creases. Keep the paper folded in half.



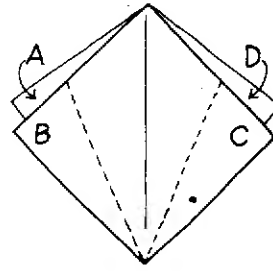
3 Hold the two ends of the folded edge between fingers and thumbs. Bring the ends down so that the corners of the paper come together, creating four flaps A, B, C and D.



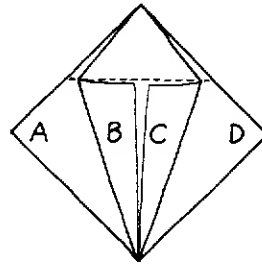
4 Fold flap B to the left and flap D to the right. . .



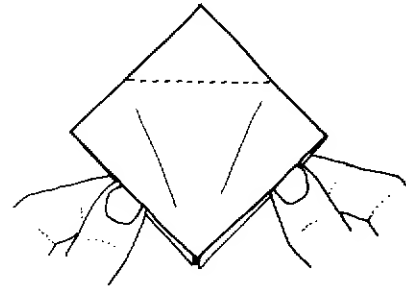
5 . . . like this. Fold the lower edges of flaps B and C to the vertical centre crease. . .



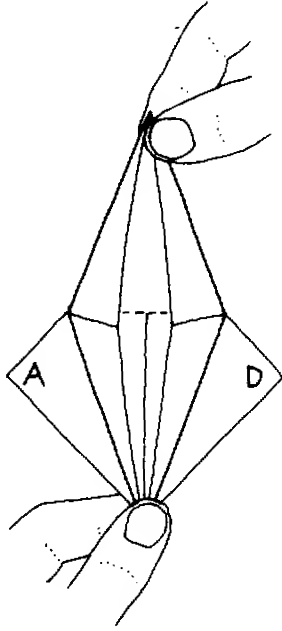
6 . . . like this. Fold the top triangular area forward over the horizontal edge. Make a very firm crease and return. Open B and C to the sides.



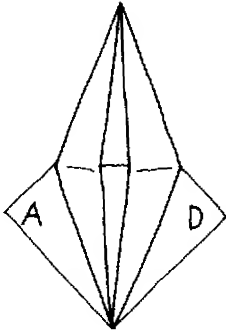
7 Raise the top layer of paper, using the horizontal crease you've just made. . .



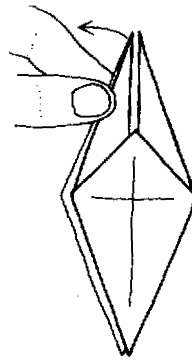
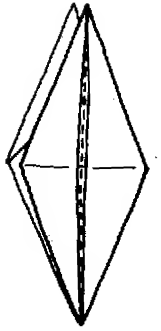
... and pull the bottom point right up as far as it will go. The two edges should come together and meet. . .



9 . . . like this. Press firmly, then turn the paper over and repeat steps 5–8 on flaps A and D.

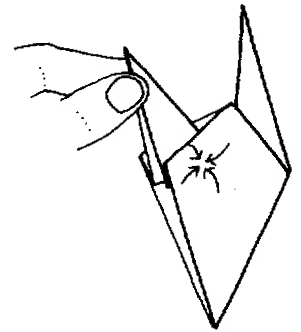


10 This is the result. Take the top left flap over to the right. Turn over and do the same again.

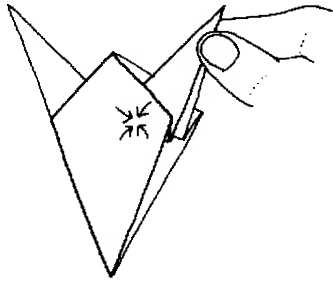


11 You should now have two narrow pointed flaps at the top. Pull one to the left. . .

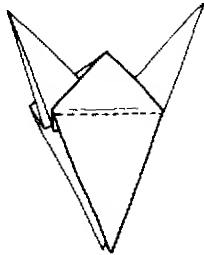
12 . . . pressing the paper flat to fix the point in its new position.



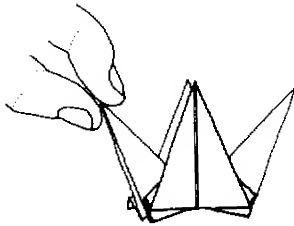
13 Then pull the other point to the right. Press the paper again to fix this point too in its new position.



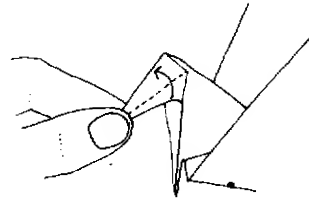
14 Fold up the bottom point on a line just below the existing horizontal crease. Turn over and do the same behind.



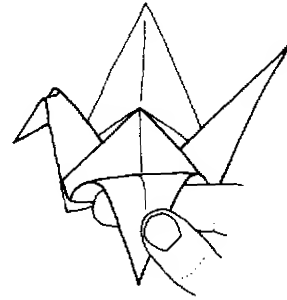
15 Take hold of one of the side points; push against the ridge with your fingertip to turn it into a trough.



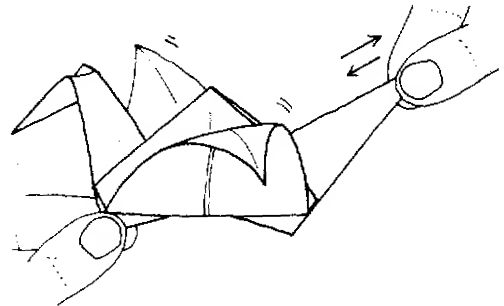
16 Then press the sides to fix the new angle of the pointed end.



17 The bird has almost taken shape. You can see its neck, head, tail and two wings. Curve the wings slightly by running them in turn between your fingers and thumbs.



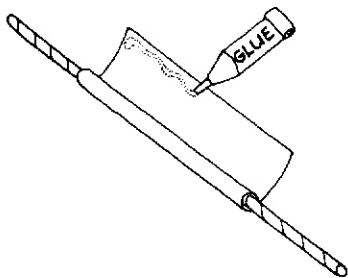
18 Hold the bottom of the bird's neck with one hand and pull its tail repeatedly with the other. Its wings will flap.



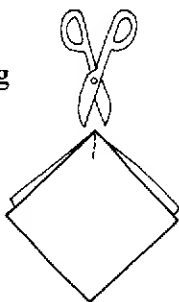
Shootin' rocket

You will need: *paper*
empty plastic container for washing-up liquid
drinking straw
modelling clay or similar
scissors
glue

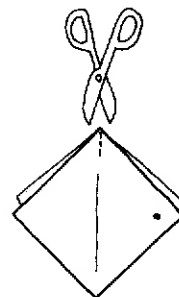
1 Start to make a paper tube by rolling a $5 \times 10\text{cm}$ piece of paper lengthways around the drinking straw. Glue the edge and take it over. Let the glue dry and remove the straw.



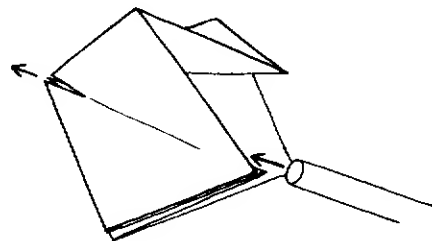
2 Using a 10cm square of paper, make a shape like the flight of a dart by completing steps 1–4 of the **Flapping bird** (page 31). Now cut a vertical slit, not more than 1cm deep, through all layers at top centre. Then fold the uppermost left flap to the right in front and fold the underneath right flap behind to the left.



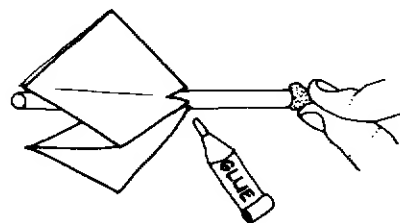
3 Once more cut a vertical slit at top centre through all layers.



4 Push the paper tube into the flight and take the end of it out through the crossed slits.



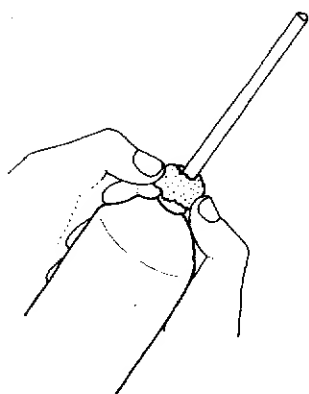
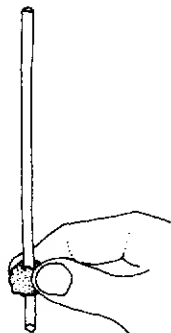
5 Fix the flight to the tube with a spot of glue. Weight the end furthest from the flight with a pellet of clay or similar. This completes the rocket.



6 Prise the top off an empty plastic container for washing-up liquid. (You may find it easier to do this if you use a spoon as a lever.) Rinse it out and dry.

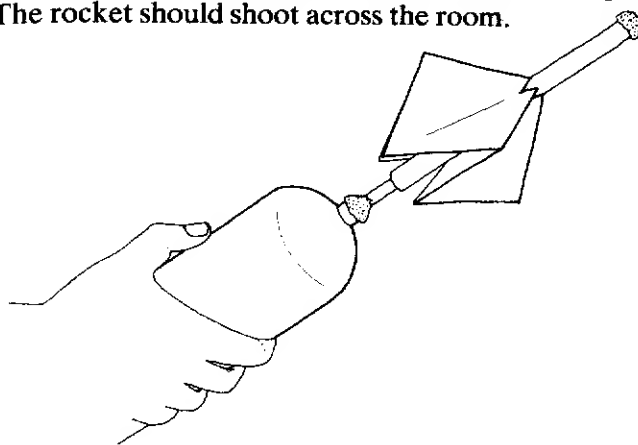


7 Fix a little modelling clay around the drinking straw, 2–3cm from one end. . .



8 . . . and let the straw project from the container like a long nozzle. Press the clay firmly all the way around to seal any gaps, and make sure the straw is standing straight. This completes the rocket launcher.

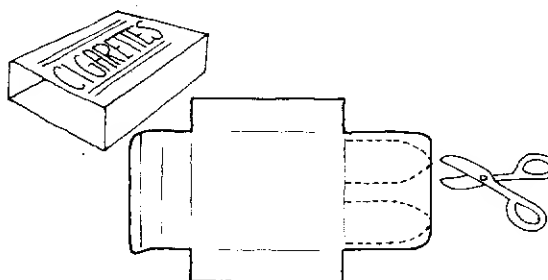
9 Fit the rocket on to the launcher. Aim and squeeze. The rocket should shoot across the room.

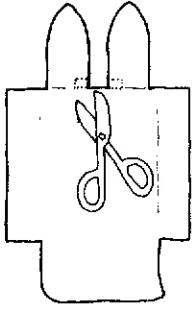


Listening dog

You will need: *empty cigarette packet*
scissors or craft knife
colouring materials

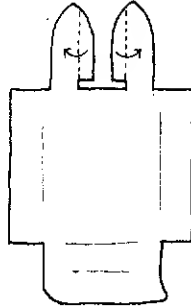
1 Remove the inside part from the cigarette packet and cut the shape of a pair of ears in one end.



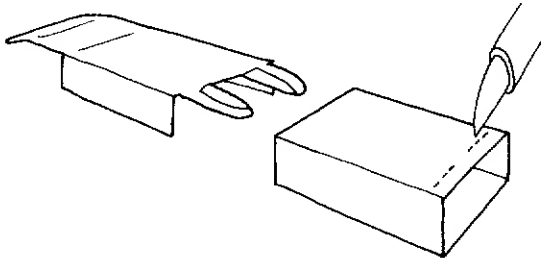


2 Cut slits, about 0.5cm long, into the inside edges at the base of the ears. Make these slits 2–3mm wide.

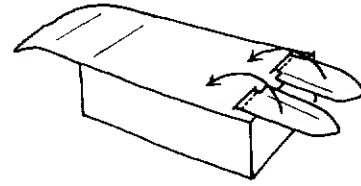
3 Fold the inside edges of the ears inwards, up to the slits.



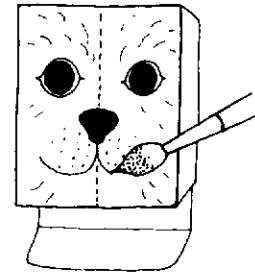
4 Take the outside part of the packet now and make two slits, about 0.5cm from the top edge, the same width as the ears when flat. Push the inside section of the packet back into the outside, passing the ears through the two slits.



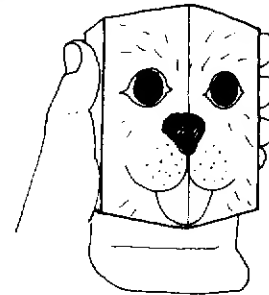
5 Open the ears and then fold them down.



6 Paint or draw a dog's face on the front of the packet. . .

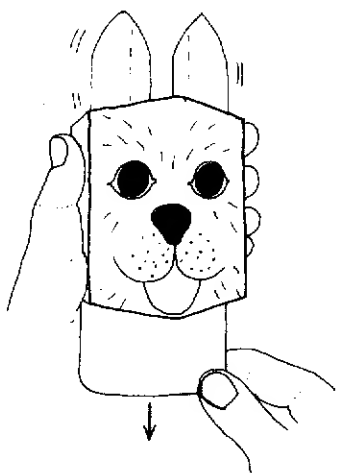


7 . . . and squeeze the sides gently, to curve the dog's face outwards.



8 Now you can show this model to a friend and ask him to guess your dog's name. To the first couple of guesses,

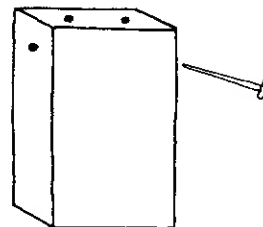
say, 'No, that's not it. Try again.' But at the third guess, whatever the name, pull the bottom flap to make the dog's ears pop up as you say, 'See, he knows his name!'



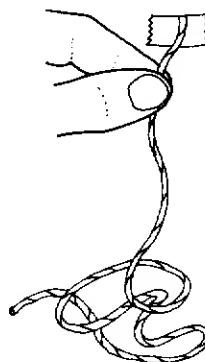
Galloping Racehorse

You will need: *empty matchbox*
string
paper
pencil and ruler
sticky tape
nail
glue
scissors
inks or paint

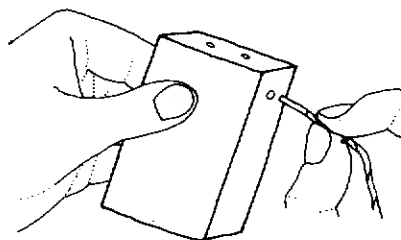
1 Make two holes with the nail in one end of the matchbox – dividing it into thirds. Find a similar distance from the end of the box along each side and make holes here too.



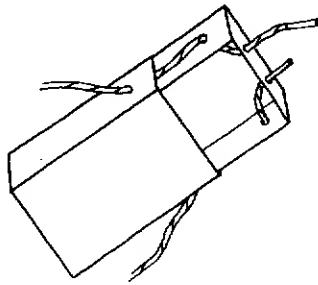
2 Cut a piece of string at least 1 metre long and wrap a little sticky tape around each end (to stop it from fraying).



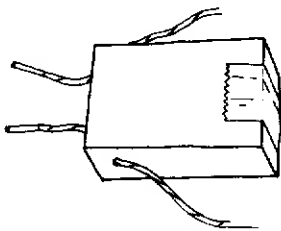
3 Thread each end of the string through a hole in the side of the box.



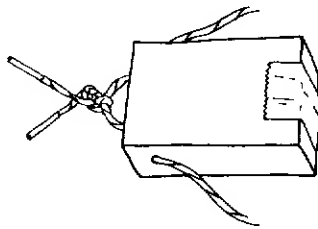
4 Carefully open the box and thread the ends of the string out through the holes in the end of the matchbox.



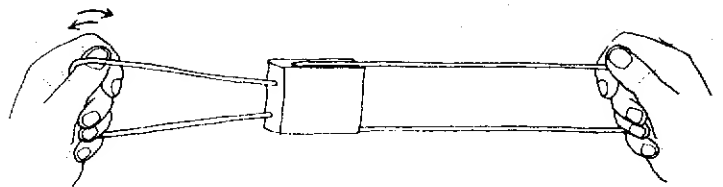
5 Close the box and fasten it with a bit of sticky tape across the other end.



6 Knot the ends of the string together.

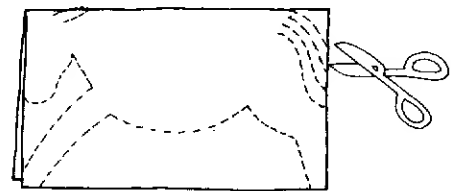


7 The mechanism is now completed. Hold the string in both hands, as shown, and turn one wrist rapidly back and forth. The box will travel along the string tracks.

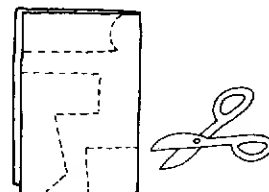


However, it's more interesting if you transform the box into a horse and jockey.

8 Take a 10 × 12cm sheet of paper and fold the shorter edges together. With the folded edge at the top, draw the shape of a horse and cut it out.

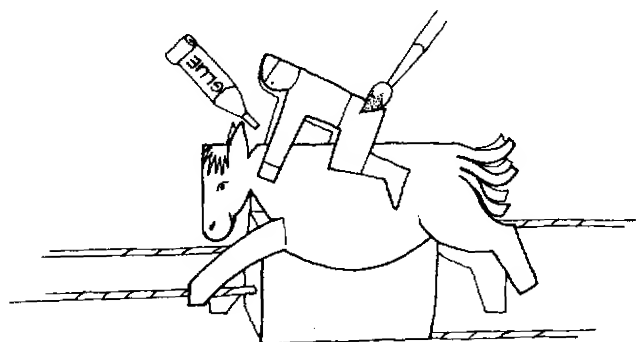


9 Take a 6 × 8cm sheet of paper and fold the shorter edges together. With the folded edge at right, draw this shape of a seated jockey and cut him out.

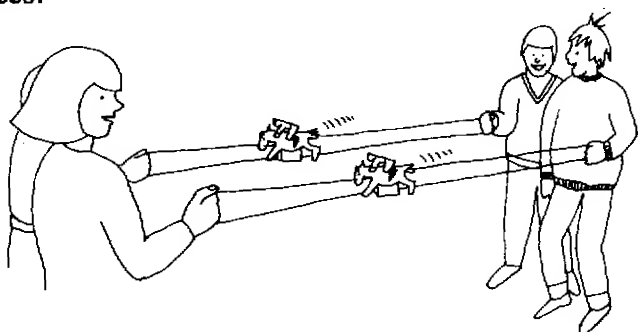


10 Raise the horse's ears and curl his tail. Make pleats at the top of his legs to lift them into a running position. Glue the two halves of his head together at the front.

11 Decorate the horse and jockey with inks or paint. Place the two sides of the horse over the matchbox and glue them in place – making sure you leave plenty of room for the string to run freely. Then glue the jockey to the horse's back.



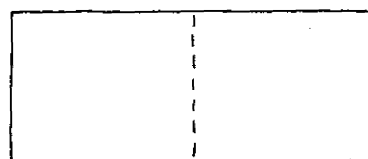
12 You can make the track as long as you like, by lengthening or shortening the string. And if you get your friends involved, you can hold your very own horse races!



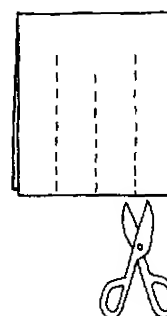
Climbing spider

You will need: materials as described on page 44

1 Prepare a rectangle of paper about 5 × 12cm. Fold the two shorter edges together and make a firm crease.



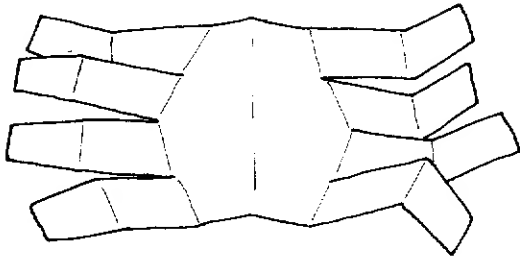
2 With the folded edge at the top, cut several slits through both layers at the bottom. Then open up the paper.



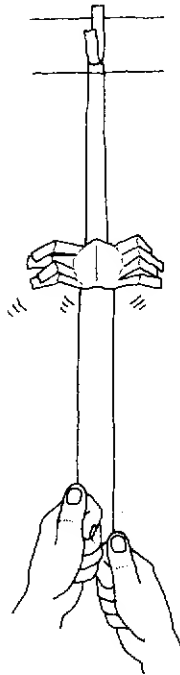
3 Now make the cut ends represent a spider's legs by folding them forwards and backwards. . .



4 ... like this. You can shape the legs as much as you like, and paint in eyes.



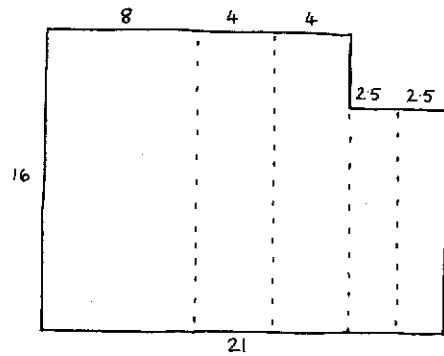
5 Glue the spider to the side of the mechanism made for the **Galloping racehorse** (page 44, steps 1-6). Loop the string over a coat hook or something similar. Pull rapidly on the ends to make the spider climb.



Jumping Jack

You will need: *thin card*
pencil and ruler
scissors
four small paper fasteners
needle and strong thread
colouring materials

1 From your card, cut one rectangle $8 \times 16\text{cm}$, two rectangles $4 \times 16\text{cm}$ and two $2.5 \times 12\text{cm}$. (These will form the head and body, two legs and two arms.)

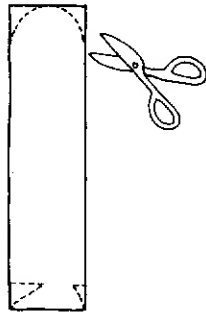


2 On the largest rectangle, draw the head and body of your Jack. You can draw any character you like, but make sure the body fills up the bottom half of the rectangle.

3 Cut around his head and shoulders and remove the surplus paper.

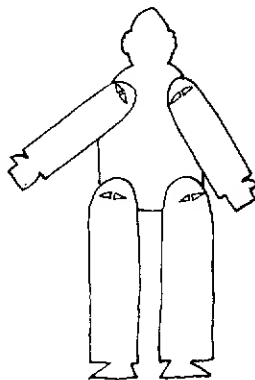


4 Place the two 4 × 16cm strips together. Cut these to form feet at one end and round off the other end.

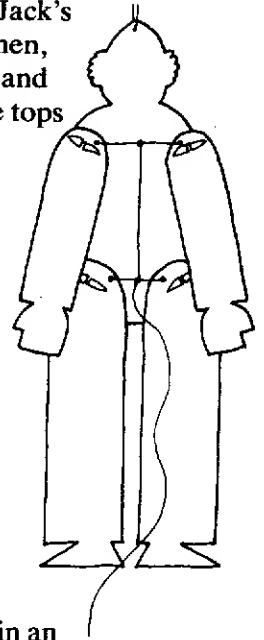


5 Place the two 2.5 × 12cm strips together. Cut hands in one end and round off the other.

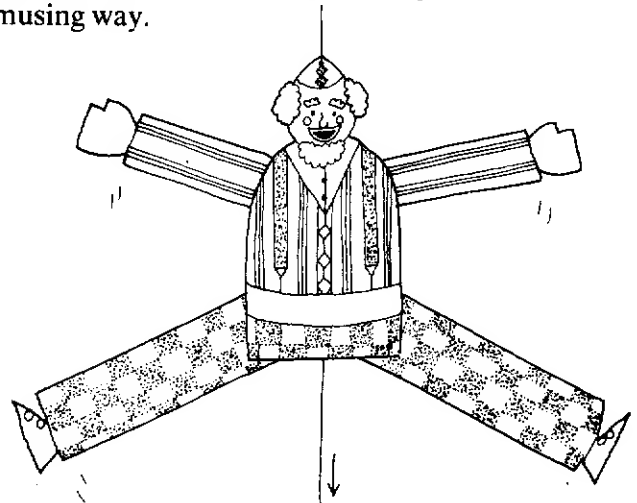
6 Fix the arms and legs to the body with paper fasteners: pass the fasteners through from the front of the body and spread the ends behind. Work the arms and legs to enlarge the holes which the fasteners have made and so ensure that the limbs move freely.



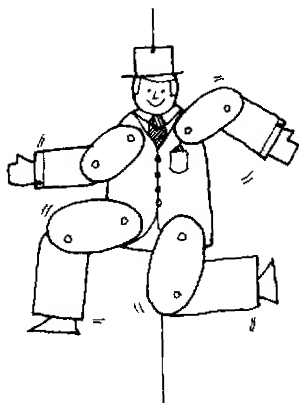
7 Fix a loop of thread to the top of Jack's head so that you can hang him up. Then, after making sure that both the arms and legs are hanging downwards, join the tops of the arms with thread. Keep the thread taut. Join the tops of the legs in the same way. Finally, knot a longer piece of thread to the centre of both these cross threads and let the end hang below the figure.



8 Turn Jack over and hang him up by the top loop. Pull the tail thread and his arms and legs should jerk up in an amusing way.



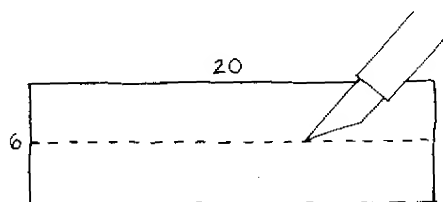
9 You could make a second character with arms and legs in two pieces. Join them loosely at elbows and knees with paper fasteners, and watch it dance!



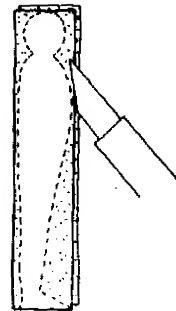
Battling boxers

You will need: *thick card or balsa wood*
thin card
craft knife
nail
string
pencil and ruler
colouring materials

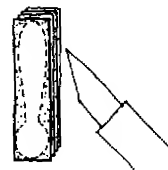
1 Cut the thick card or balsa wood into two 3×20 cm strips.



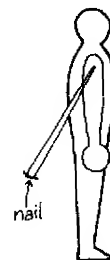
2 Prepare two 3×15 cm strips of thin card. Draw a simple side-view of a man on each, filling up as much of the space as you can, and cut them out.



3 Prepare four 1.5×6 cm strips of thin card and draw the shape of an arm, with boxing glove, on each. Cut them out.



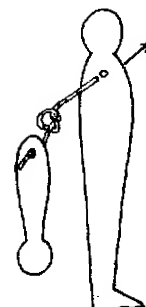
4 Place a cut-out arm on each side of one man and use the nail to pierce a hole through both the arms and body.



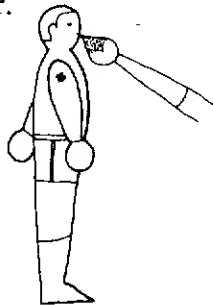
5 Wrap a piece of sticky tape around one end of the string and thread it through the hole in one of the arms.



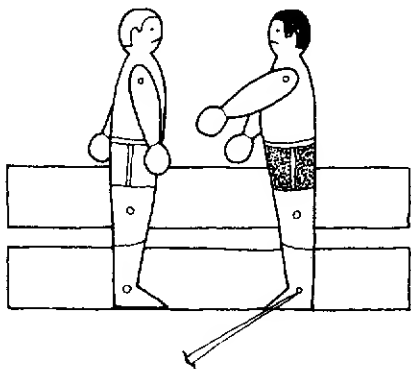
6 Tie knots in the string close to the arm on either side. Thread the string through the body and tie another knot. Thread through the other arm and tie a final knot.



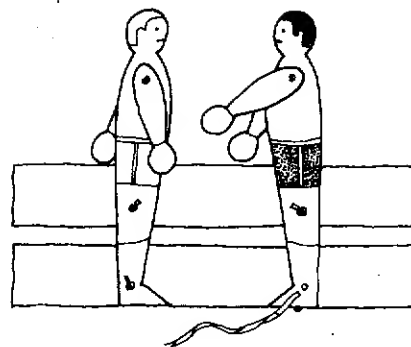
7 Make sure the arms swing freely and then trim off the surplus string. Draw and colour the man to make him look like a boxer. Repeat steps 4–7 with the other pieces to make a second boxer.



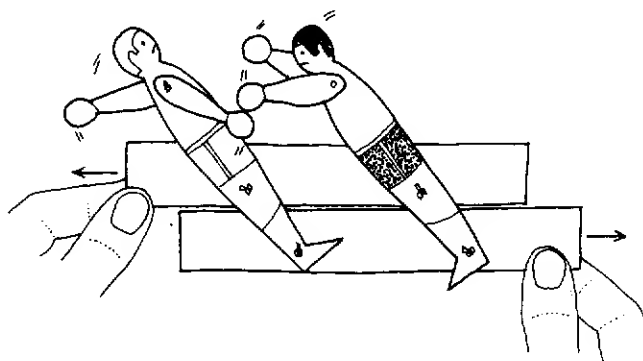
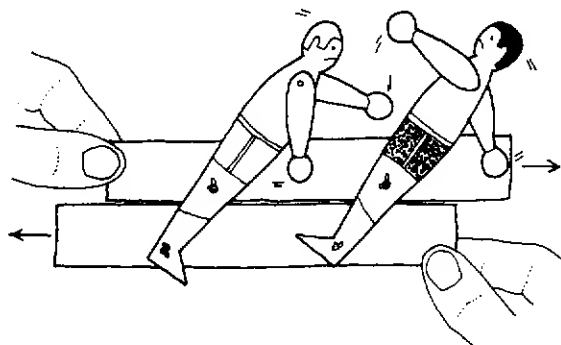
8 Place the two strips of thick card or balsa wood on a flat surface 1cm apart, one above the other. Place the two boxers on these strips, 5cm from the left and right edges. Make sure that they face each other and that their feet rest on the bottom edge. Pierce holes through their ankles and thighs and the supporting strips behind. These should be about 1cm above the lower edge of each strip.



9 Join the boxers to the supporting strips by threading string through each of the holes and tying knots in front and behind. Trim off the surplus string.



10 Hold the strips at either end, and move them from side to side. The boxers will lunge at each other in turn with their arms flailing.



Finger puppets

You will need: *paper*
pencil and ruler
scissors
glue
colouring materials

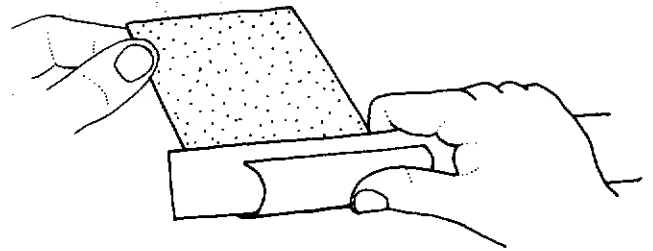
Here you can make a variety of faces which become puppets when fitted on to your fingertips. It's easy to give the puppets different moods simply by moving the fingers which carry them. Hold a finger straight up to express boldness, but let it bend forward to show shyness or sadness. A rapid up-and-down movement may make the puppet seem angry or excited, and shaking, of course, shows fear.



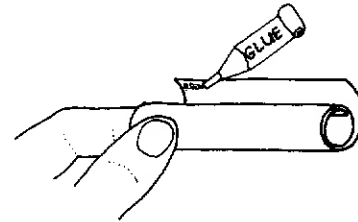
Why not create a play using your puppets – to entertain friends, or a younger brother or sister. You could perform it in the simple theatre described on page 63. Use your imagination, and you can create a whole cast of amazing characters!

Girl

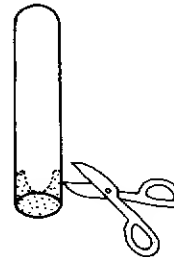
1 Prepare a rectangle of paper, about 7×12 cm. Curl the paper by running it lengthways once or twice between your thumb and the edge of a ruler.



2 Roll the paper around your finger, glue the edge and press down to make a tube.



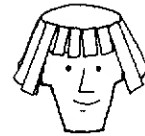
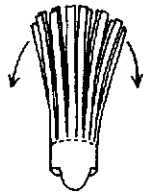
3 Cut a curved shape about 1cm from the bottom (to become the lower half of a face). Then cut around from one side of the curve to the other and remove the surplus paper.



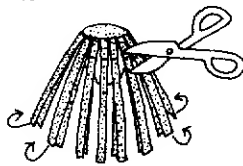
4 Work around the tube, making a series of cuts from the top to a distance of 1cm from the bottom. These cuts should not be more than 0.5cm apart.



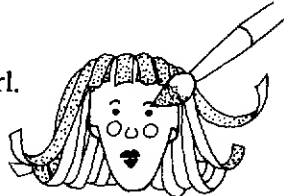
- 5** Fold down all the narrow strips – these will represent hair. **9** Completed.



- 6** Cut away the two or three strips which hide the face to make a fringe. Curl up the ends of the hair by running them in turn between your thumb and a scissors blade. You can give your characters different hair colours by using coloured papers. If your paper is coloured on one side only, roll the paper into a tube (stage 2) with the coloured side inwards.

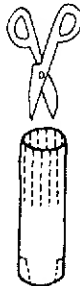


- 7** Complete by drawing or painting the features of a girl.



Boy

- 8** Prepare a 5×12 cm rectangle of paper. Complete steps 1–7 of the **Girl** (page 58), but make the jaw squarer in step 3, leave the hair straight, and draw the features of a boy. Because the tube is shorter, the hair will be shorter.



Old woman

- 10** Make the jaw very round in step 3 and curl the hair to make an old woman like this.



Old man

- 11** Use a 6×12 cm rectangle of paper; make a tube and cut into the bottom edge as well as the top edge. . .



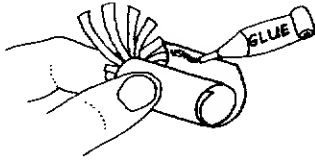
- 12** . . . to make an old man with a beard like this.



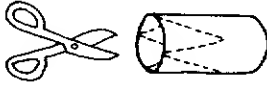
Crown

If you put a head-dress on one of your finger puppets, his or her character becomes changed instantly. Put a crown on the girl and she becomes a princess; put a crown on the old man and he becomes a king. A head-dress also helps to keep a puppet's hair neatly in place.

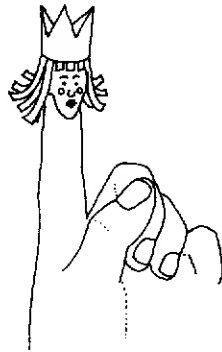
1 Make a tube from a $3 \times 8\text{cm}$ rectangle of paper. Place a puppet on your finger first, then wrap the paper around it.



2 Cut away triangular shapes from the tube.

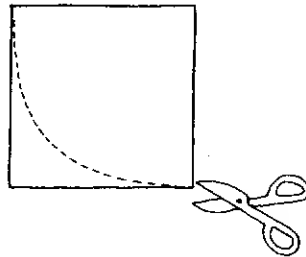


3 The crown completed.

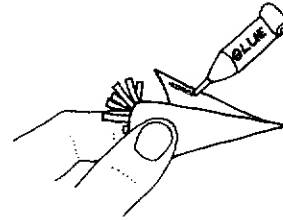


Wizard's hat

1 Prepare a piece of paper about 8cm square. Cut a bold curve from corner to corner and discard the surplus.



2 Place a puppet on your finger, and roll the paper around it to make a cone. Glue the edge of the cone to the puppet's head.



3 This will look like a wizard's hat if you decorate it suitably with a moon and stars.

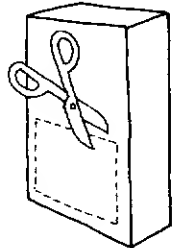
Night cap

4 Bend down the point to make a woollen hat. Your character can then become a gnome, or a man in his night cap!



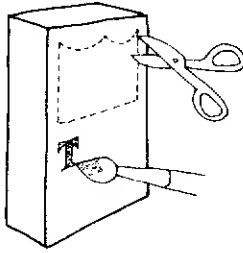
Finger puppet theatre

You will need: *empty cereal packet or similar*
scissors or craft knife
colouring materials

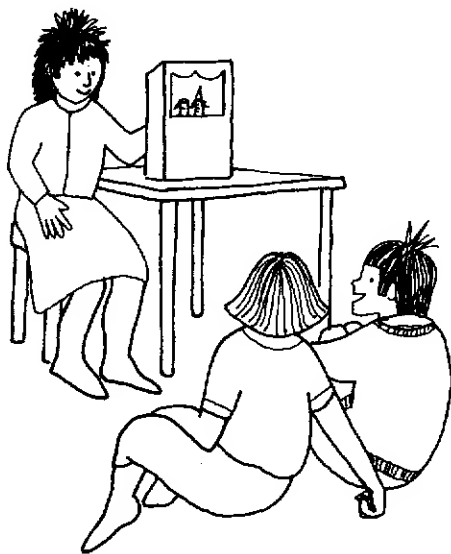


1 Cut a window in the *bottom* half of one side of the packet. This is where your hand will go in.

2 Cut another window in the *top* half of the other side. This will be the stage. You can shape this window so that curtains seem to hang above it and decorate with paint or coloured papers. If you want, you can write the name of the theatre on the front.



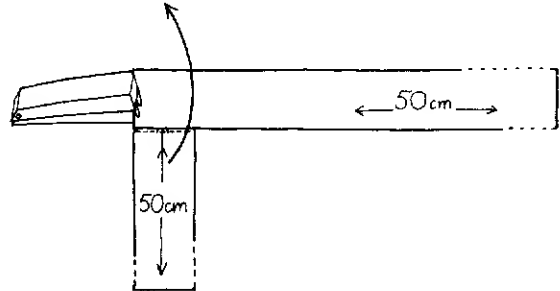
3 Let your audience sit well below the theatre (so that they can see the puppets but not too much of your hand). Try placing the theatre on a table and have your audience sit on the floor.



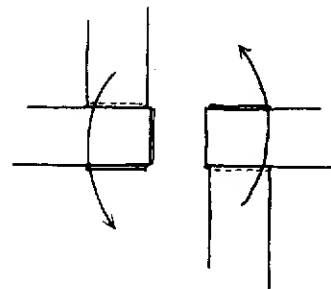
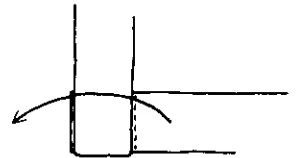
Bouncing bunny

You will need: *strong drawing paper*
scissors
stapler or glue
empty matchbox
colouring materials

1 Prepare two strips of strong paper, about $3 \times 50\text{cm}$. Staple or glue one end of each strip together to form a right angle. Then fold one strip across the edge of the other.

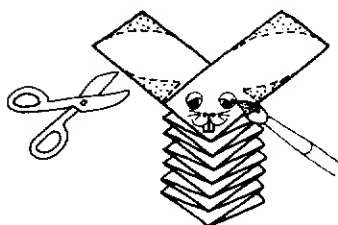
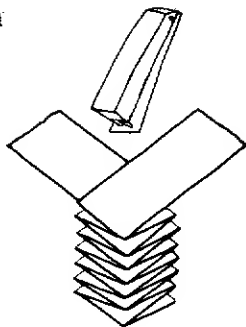


2 Fold the second strip across the edge of the first.



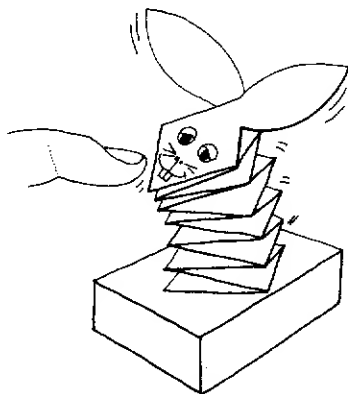
3 Continue, alternately folding each strip across the edge of the other. . .

4 . . . to a distance of 3–4cm from the end of the strips. Glue or staple where the strips cross and leave the ends free to form ears.



5 Shape the rabbit's ears by cutting. Draw his eyes and nose.

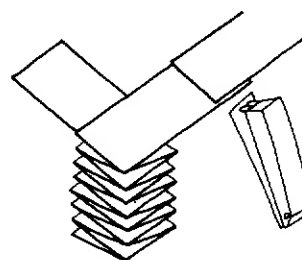
6 Fix an empty matchbox to the bottom of the rabbit as a base. Poke him with your finger, or press down on his nose, to make him bounce and flop about.



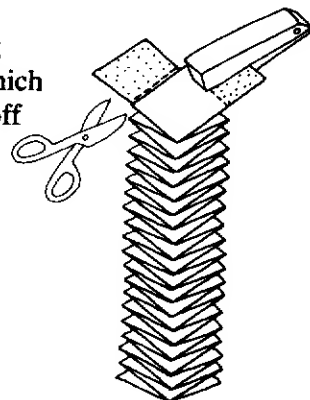
Wiggling snake

You will need: *strong drawing paper*
paper scraps
thread
stick, about 50cm long
pencil and ruler
stapler or glue
scissors

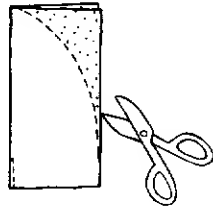
1 Prepare six strips of strong paper, about 3 × 50cm. Take two paper strips and complete steps 1–5 of the **Bouncing bunny** (page 65). Then staple or glue another strip to each of the ends and continue plaiting.



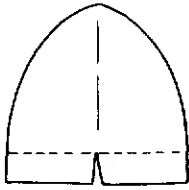
2 When completed, join a third pair of strips and continue plaiting until you've made a long spring which will form the snake's body. Trim off the ends neatly and fix the top end of the spring with staples or glue. Put it aside for the moment.



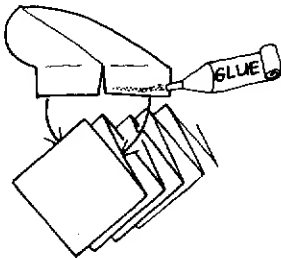
3 To make the snake's head, prepare a 6cm square of paper and fold it in half. Cut about 1cm into the folded edge. Then cut a bold curve through both layers in the opposite corner.



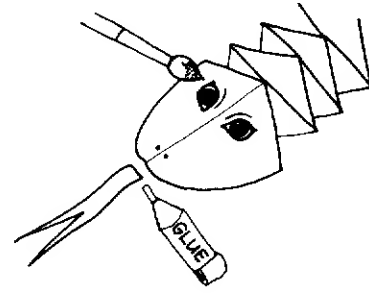
4 Open it up and you should have a shape like this. Fold the bottom flaps forwards. . .



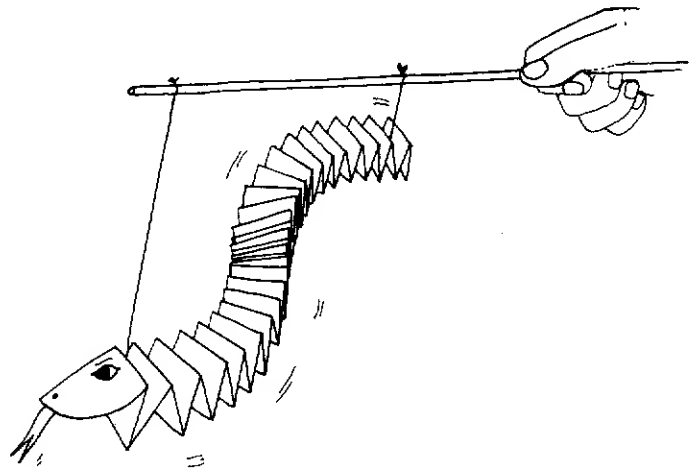
5 . . . and tuck them into the sides at one end of the springy body (the head will take shape as you do this). Fasten with a little glue.



6 Draw or paint in the eyes. Use a scrap of paper to make the tongue. This completes the snake.



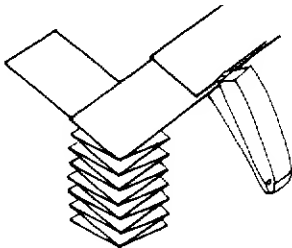
7 Fasten the snake's neck to a stick with thread so that its head hangs down. Fasten its tail to the stick with a much shorter thread. Hold the stick and move it slightly – the snake will wriggle and turn.



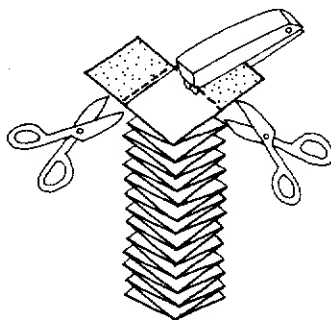
Jack-in-the-box

You will need: *strong drawing paper*
pencil and ruler
scissors or craft knife
staples or glue
colouring materials

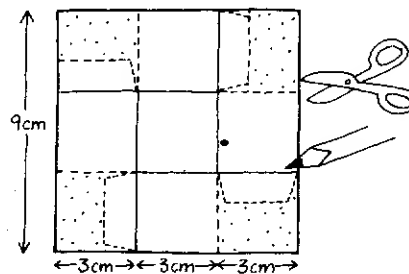
1 Prepare four strips of strong paper, about $3 \times 50\text{cm}$. Take two of the paper strips and complete steps 1–5 of the **Bouncing Bunny** (page 65). Then staple or glue another strip to each of the ends and continue plaiting.



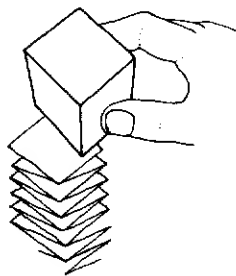
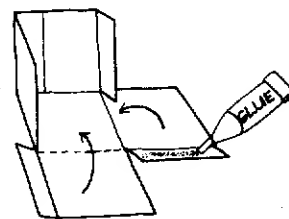
2 Fasten the ends of the strips together with staples or glue and trim off the surplus. This completes the spring.



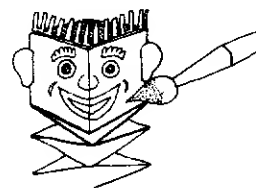
3 Take a 9cm square of paper and mark the edges at 3cm intervals. Join the marks up to divide the paper into nine little squares. Mark flaps, as shown, in the four corner squares. Then cut out along the dotted lines.



4 Fold along the pencil lines to raise the four sides of a box. Glue the flaps and fit them neatly to the *inside* walls of the box.

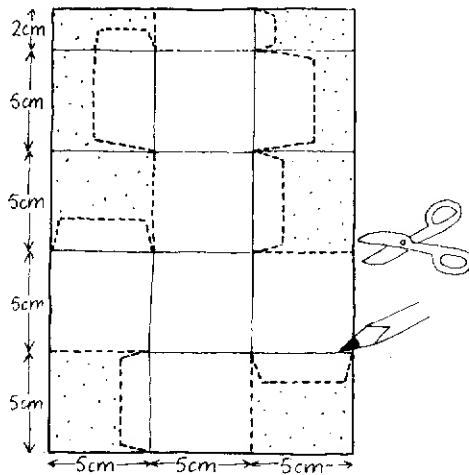


5 Slip the box over the end of the spring. It should rest there firmly.

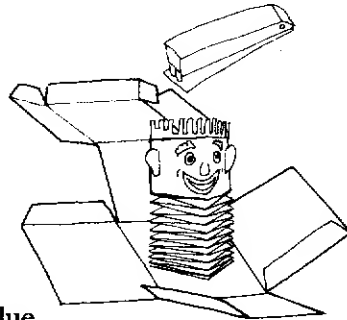


6 Paint a big smiling mouth and eyes on the box. Use scraps of paper to make a fringe of hair and a pair of ears.

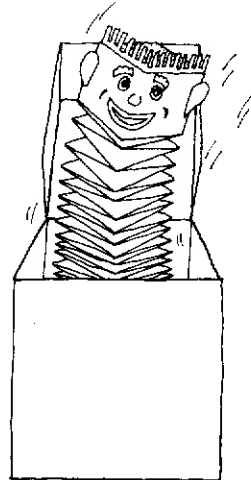
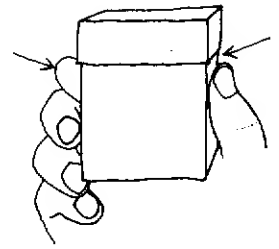
7 Take a $15 \times 22\text{cm}$ rectangle of paper and mark the edges at 5cm intervals as shown. Join the marks up to divide the paper into twelve little squares with three extra rectangles at the top. Draw flaps, as shown, 1cm wide. Cut out along the dotted lines.



8 Fold along all the solid lines and raise the sides of the box. Glue Jack to the bottom of the box, making sure he is placed well forward and facing the front. Then glue or staple the flaps to the inside of the box, so that the sides and lid take shape. Do not fasten the lid down.



9 Close the lid and hold the box as shown. Just press the sides. . .

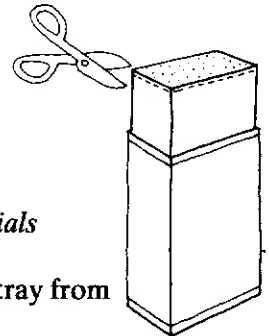


10 . . . and Jack will pop out.

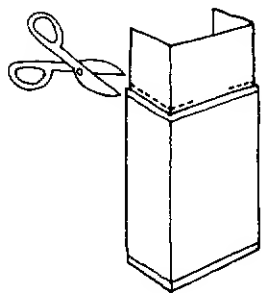
When not in use, keep the Jack-in-the-box open. If left closed the spring may lose its tension.

Swinging acrobat

You will need: two empty matchboxes
two wood battens, about $2 \times 25\text{cm}$
string
scissors
nail
glue
sticky tape
pencil and ruler
colouring materials

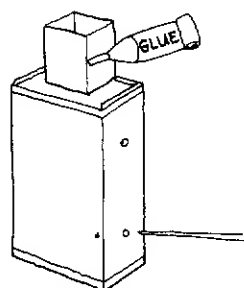
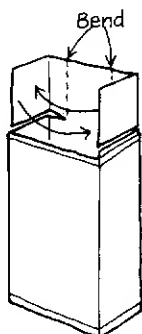


1 Push part of one matchbox tray from its casing and cut away the end.



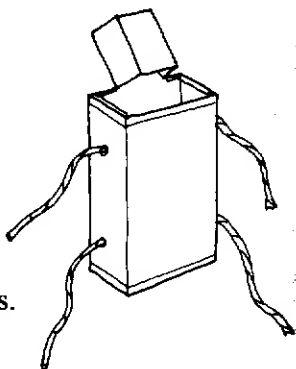
2 Cut into the sides of the tray, above the edge of the casing.

3 Bend the bottom of the tray as shown, so that the side flaps overlap. . .

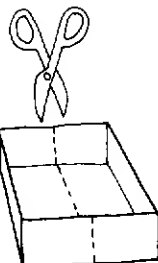
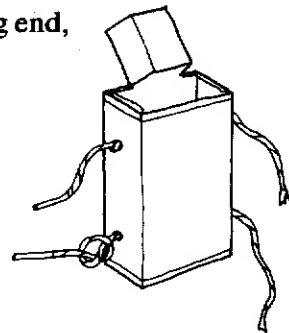


4 . . . and fasten them together with a spot of glue. This forms the acrobat's head. Now make two holes in each side of the box with a nail.

5 Cut two pieces of string at least 12cm long. Neatly wrap a small piece of sticky tape around one end of each (to stop the ends from fraying), and thread one through the top two holes and one through the bottom two holes.

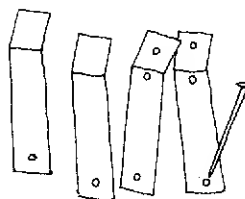
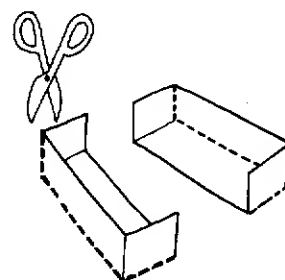


6 Tie a knot in each protruding end, close to the side of the box.



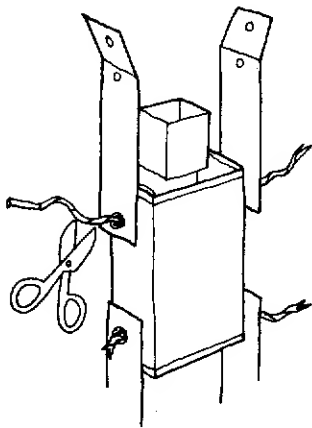
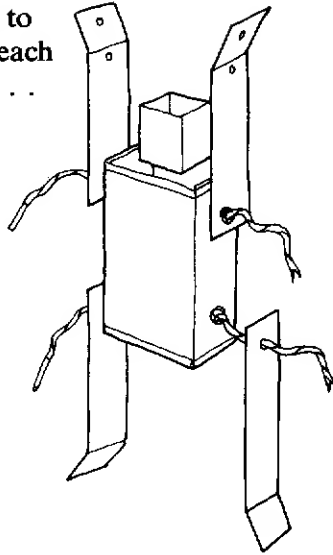
7 Take the tray from the other empty matchbox and cut it in half lengthways.

8 Then cut each half as shown to make four similar pieces.



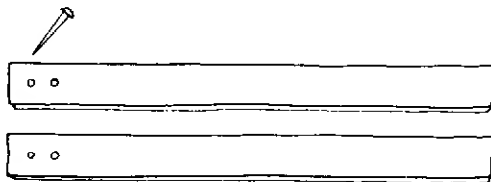
9 These will become the acrobat's arms and legs. Pierce a hole in one end of each as shown. In two of the pieces, pierce another two holes, 1cm apart, at the other end.

10 Slip the arms and legs on to the string ends. Tie a knot in each string close to the arm or leg. . .

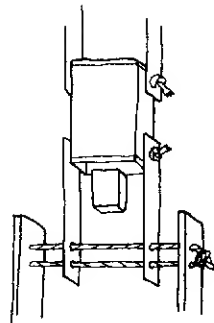
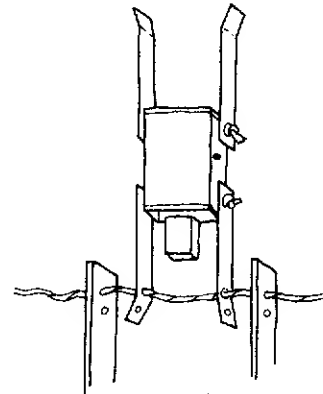


11 . . . and cut off any surplus.

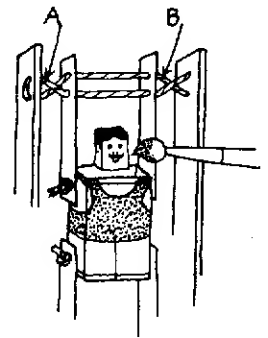
12 Prepare the handles by piercing two holes, 1cm apart, in one end of each of your battens.



13 Place the acrobat on a table, head down, between the two handles as shown. Take a piece of string, about 20cm long, and wrap sticky tape around one end. Thread this end through the uppermost holes in the handles and arms. . .

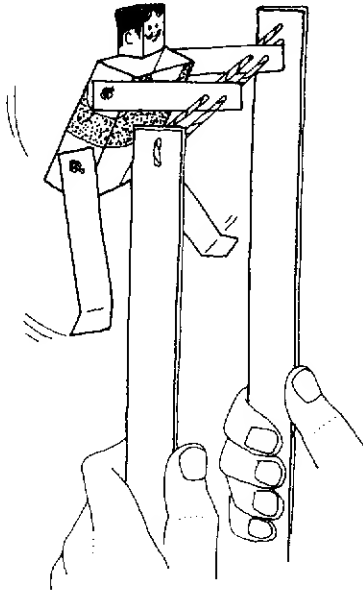


14 . . . then take the string back through the lower holes and tie a knot to complete the loop. Cut off any surplus string.



15 Bring down the acrobat to lie between the handles. Draw in the face and perhaps a colourful costume.

16 Pull the two handles apart and the acrobat should swing up and around with his legs flying.



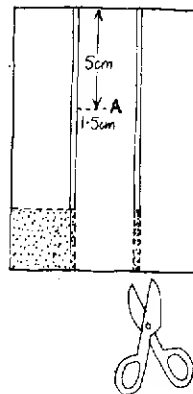
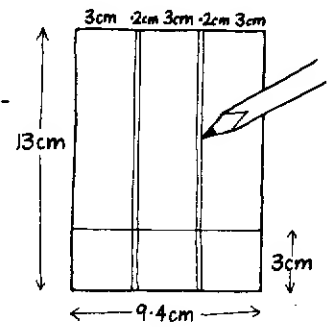
IMPORTANT Before using this toy make sure the strings are crossed at points A and B as in fig 15 on page 77. Sometimes the strings become twisted, or crossed the wrong way, and this prevents the toy from working properly.

Kicking footballer

You will need: *thin card*
scissors or craft knife
pencil and ruler
glue
colouring materials

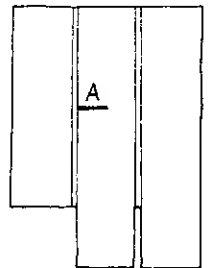
Both this figure of the **Kicking footballer** and that of the **Goalie** which follows, are constructed for use with the **Football pitch**, page 86.

1 Prepare a 9.4cm × 13cm card and, with pencil and ruler, divide it to the measurements shown.

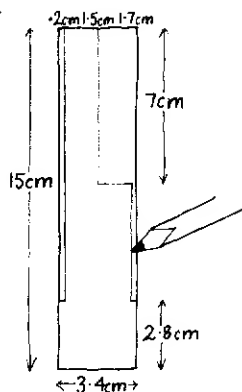


2 Cut away two sections at the bottom as shown. Cut a horizontal slit in the centre panel at A.

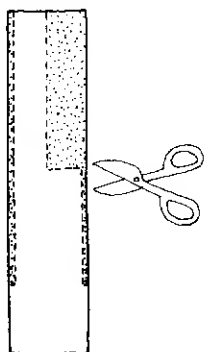
3 Score the lines by running over them with a scissors point, craft knife or perhaps a very hard pencil. This will make it easier to fold along these lines later on. This is the casing.



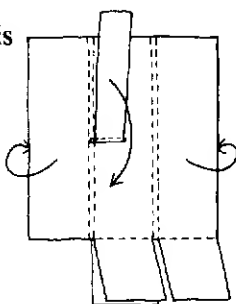
4 Prepare a $3.4 \times 15\text{cm}$ card and divide it to the measurements shown.



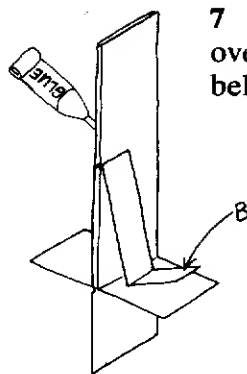
5 Cut out the shape shown by dotted lines.



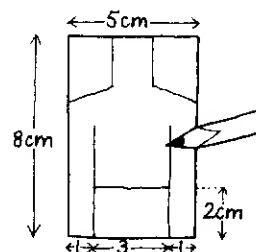
6 Push the narrow top section of this shape through the slit in the casing (A fig 3) from behind and lift it as far as it will go. Then fold it down. Fold the side panels of the casing to overlap each other behind. Fold up the bottom flaps. . .



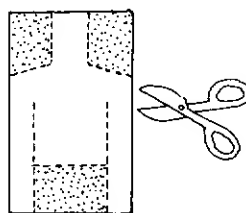
7 . . . like this. Glue the overlapping panels together behind. Fold up the foot at B.



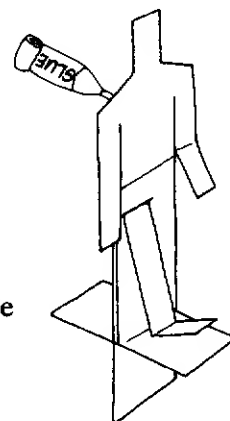
8 Take a $5 \times 8\text{cm}$ card and draw the lines as shown.



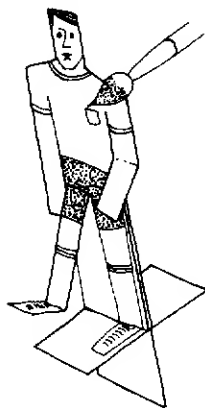
9 Cut along all the lines and remove the surplus pieces.



10 Glue this shape to the casing. You should now be able to recognize the form of a footballer.



11 Draw his face and colour his shirt and shorts to complete.

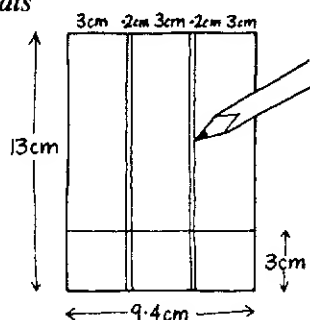


When you pull down the bottom flap, his leg should kick right up. (The flaps pointing to the front and back will be used to fit the kicking footballer to the football pitch.)

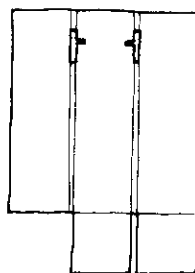
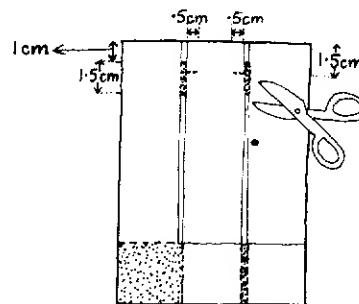
Goalie

You will need: *thin card*
scissors or craft knife
pencil and ruler
glue
colouring materials

1 Prepare a $9.4 \times 13\text{cm}$ card and divide it to the measurements shown.

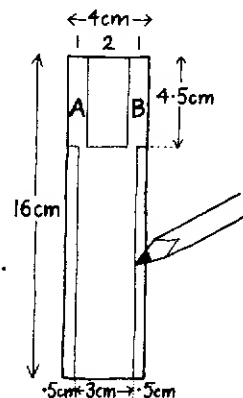


2 Cut away two sections at the bottom as shown. Then, starting 1 cm from the top, cut two vertical slits, 1.5 cm long as shown. Then, 1.5 cm from the top, cut two 0.5 cm horizontal slits.

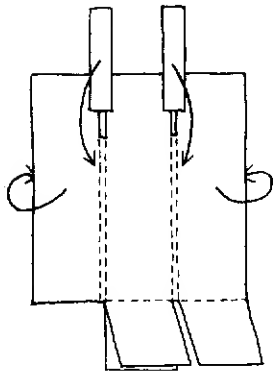
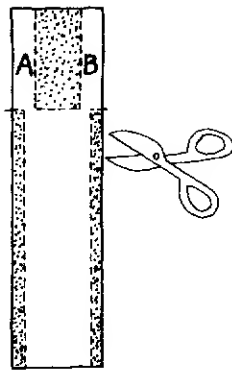


3 . . . to look like this. Score the lines by running over them with a scissors point, craft knife or hard pencil. Again, this is to make folding easier later on. This is the casing.

4 Prepare a $4 \times 16\text{cm}$ card and divide it to the measurements shown.

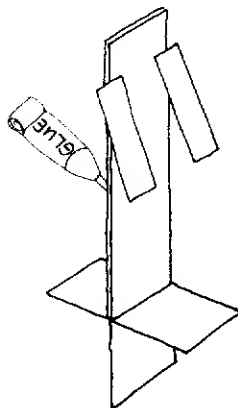


5 Then cut out as shown, along the dotted lines.

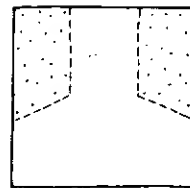
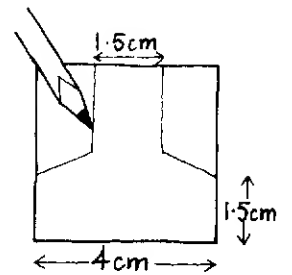


6 Push the two arms, A and B, through the horizontal slits in the casing from behind and lift them as far as they will go. Then fold them down. Fold the side panels of the casing to overlap each other behind. Fold up the bottom flaps.

7 Glue the overlapping panels together behind.

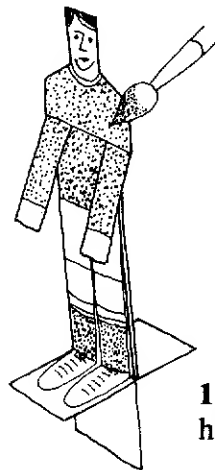
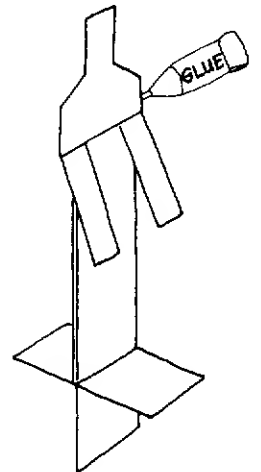


8 Take a 4×4 cm card and draw the lines as shown.



9 Cut out this shape.

10 Glue this shape to the casing so that its bottom edge lies just above the arms.



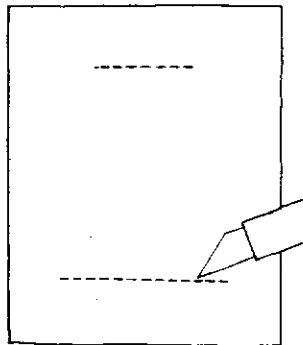
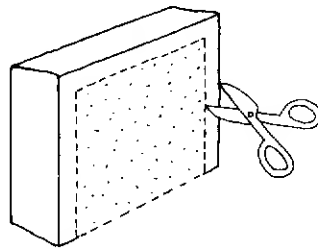
11 Draw his face and legs and colour him to look like a goalie.

When you pull down the bottom flap, his arms should come forward and up. (The flaps pointing to the front and back will be used to fix the goalie to the football pitch.)

Football pitch

You will need: *empty cereal packet or similar thick card, the size of your pitch*
paper strips or tape
scrap paper
pencil and ruler
craft knife
glue
kicking footballer and goalie (pages 78–82)

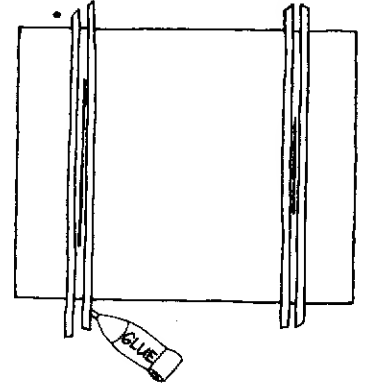
1 Cut a window in one side of an empty cereal packet or something similar. This will form the goal.



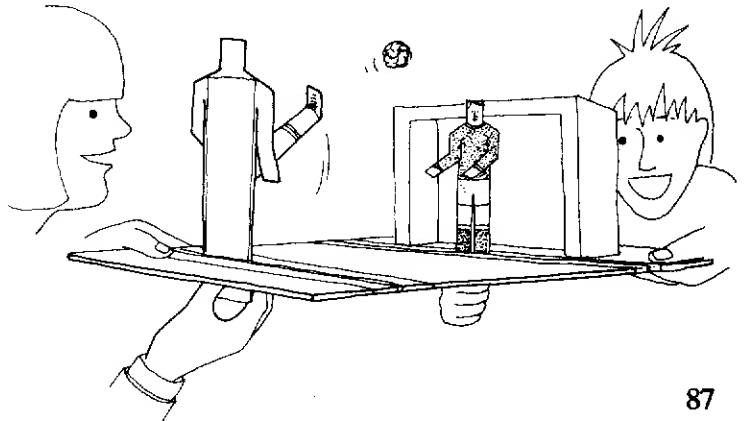
2 Cut two slits in the card – these will become tracks for the footballers. The length and position of the tracks will depend on the size of the card and the width of the goal. Just make sure you don't take your cuts too near the edges so as not to weaken the card.

3 Lay paper strips or tape, long enough to overlap the sides of the card, in front and behind the cut-out tracks. Glue the ends of the strips underneath the card at one side.

Place the goalie in the shorter track so that the lever hangs down through the slit and the front and back flaps lie between the tape and card. Place the kicking footballer in the longer track similarly, so that he faces the goalie. Make sure that both figures slide freely along their tracks – then glue the free ends of the tapes underneath the other side of the card.



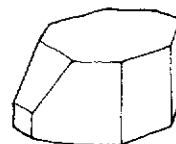
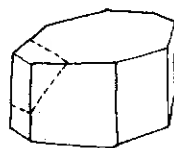
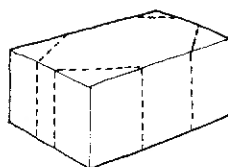
4 Fix the goal behind the goalie with a little glue and make a ball by rolling a scrap of paper between your hands.



5 With a friend holding the lever of one figure and you holding the other, drop the ball at the kicking footballer's feet. Move him from side to side, controlling the ball with his extended foot, then shoot! It's a goal – or perhaps not if the goalie blocked the ball with his body or knocked it up with his arms. Try again. . . .

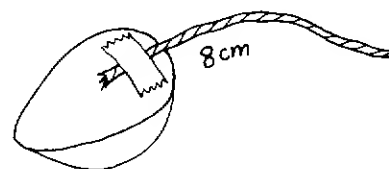
Peek-a-boo mouse

You will need: *expanded polystyrene (packing material)*
or cork
string
household size matchbox
thick card
paper
three map pins
two dressmakers' pins
ribbon or cotton tape
paper clip
glue
sticky tape
scissors
craft knife
pencil and ruler
bristles and felt scraps (optional)

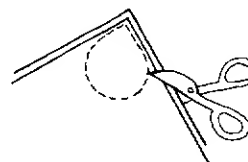


1 To make the mouse, first prepare a small block of polystyrene with dimensions about $2 \times 2 \times 4$ cm (or a cork if you have one). Cut off the corners, then shape the nose and finally round off the edges.

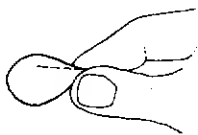
2 Use a piece of string, about 8cm long, for the tail. Fasten one end under the body with sticky tape.



3 Cut two ear shapes, not much more than 1cm across, in paper or felt scraps. It is best to do this by placing two pieces of paper or felt together and cutting through them both to make a pair of identical shapes.



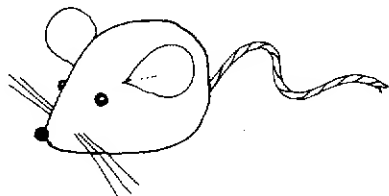
- 4 Squeeze the pointed parts. . .



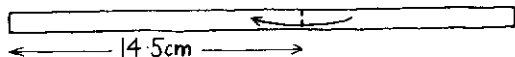
- 5 . . . and push them into cuts made at the sides of the head.



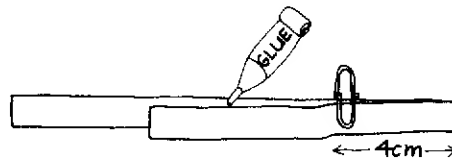
- 6 Two black map pins will make a pair of beady eyes. A third map pin, perhaps coloured red, will make a lovely shiny nose. You can use a few nylon bristles from an old hand brush to make whiskers. If you like you could also make claws from paper or felt and fasten these under the body with sticky tape. This completes the mouse.



- 7 Start to make the mechanism by cutting a piece of cotton tape or ribbon, about 1cm wide, to a length of 25cm. Measure 14.5cm from one end and fold the tape back on itself.



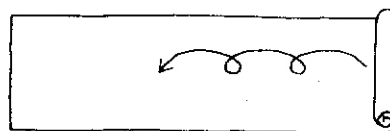
- 8 4cm from the fold, fasten the two layers together with a paper clip. Glue the free end of the upper layer to the layer beneath. When dry, remove the clip.



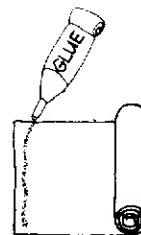
- 9 You have a length of tape or ribbon with a loop at one end.



- 10 Now prepare a rectangle of paper, 5.8cm x 20cm. Roll it up tightly.

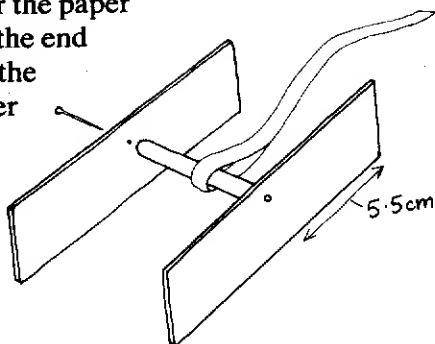


- 11 Glue the end and continue rolling to make a neat cylinder.

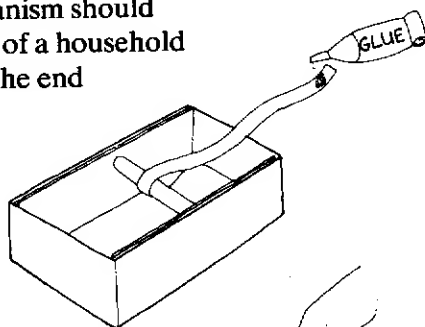


- 12 Prepare two rectangles of thick card, 3 x 11.5cm. At a point 5.5cm from one end and 1cm from the top, push a dressmakers' pin inwards through each card.

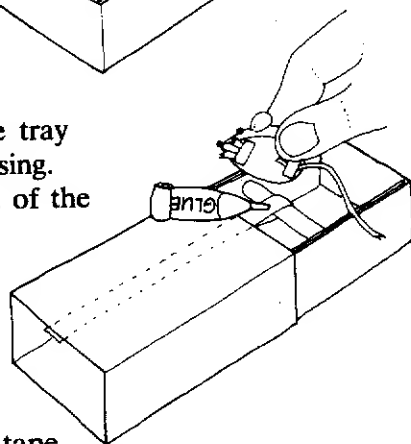
Loop the ribbon over the paper cylinder and then fit the end of the cylinder on to the two pins. The cylinder should roll freely on the pins.



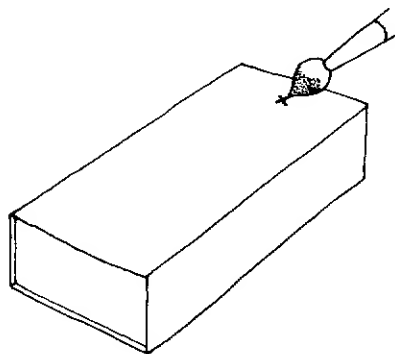
13 The whole mechanism should fit neatly into the tray of a household size matchbox. Glue the end of the tape . . .



14 . . . and slide the tray into the matchbox casing. Fasten the glued end of the tape to the inside of the casing; the end of the tape should be placed centrally in line with the end of the casing. Now glue the mouse to the tape where it's stretched over the roller.



15 Close the box and make a secret mark on the top. This is just to remind you which end of the box to open.



16 Whenever you open the box, the peek-a-boo mouse will pop out over the edge – and pop right back whenever you close it.

